Space Weather Forecast

Issued on Tuesday, 26 March 2024 at 01:31 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further Minor/Moderate radio blackouts (R1/R2) likely. A slowly reducing chance of Minor to Moderate geomagnetic storms (G1-G2) over the next few days as coronal mass ejection (CME) influence eases. A slight chance of further Strong geomagnetic storm (G3) interval at first.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was moderate with the large sunspot region moving into the west producing an moderate class flare at 25/0644UTC. Eight active regions currently on the visible disc. The large region moving into the western hemisphere (AR3615) remains by far the most complex group, although this region continues to display slight simplification of its magnetic structure. Changes in other groups were minor. The small, bipolar region to the southwest of AR3615 was numbered AR3623.

No further significant Earth-directed Coronal Mass Ejections (CMEs) observed on available imagery over the last 24hr, although investigation of any glancing risk from a CME associated with a common class flare associated with a small sunspot region in the northeast at 25/1415UTC is ongoing.

Solar Wind / Geomagnetic Activity: The solar winds were initially at strong-very strong speeds (750-850 km/s) following the arrival of the CME associated with the strong flare on the 23rd March. From around 25/1500UTC winds began erratically declining to reach current strong speeds of around 600km/s. The interplanetary magnetic field (IMF) was initially strong following the CME arrival, but steadily eased, becoming weak from 25/1000UTC where it remains. The important north-south parameter (Bz) initially strongly positive but also declined in magnitude, becoming generally weakly positive from 25/1000UTC.

The net result of the above solar wind measures was initially Active to G1 (Kp4-5) geomagnetic conditions, which slowly declined to Quite (Kp2).

Energetic Particles / Solar Radiation: Solar radiation was at S1 levels initially but on a slow and steady decline, falling below the S1 threshold from 25/1410UTC.

Four-Day Space Weather Forecast Summary
Solar Activity: Generally moderate solar activity is expected, with further Moderate flares expected from primarily the large and highly active region moving into the western disk through the forecast period, with a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A coronal mass ejection (CME) associated with the strong flare on the 23rd March arrived at L1 at 24/1410UTC. There are no other Earth directed CMEs in the forecast.

Solar winds at current strong levels expected to decline erratically through day 1 (26 Mar) and

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into day 2 (27 Mar) as the impacts from the CME continue to wane. Winds are expected to continue to fall towards background values into day 3 and 4 (28-29 Mar) in the absence of forecast enhancements.

Generally Unsettled to Active conditions expected initially but with a steadily reducing chance of further G1-G2, minor to moderate storm conditions and a slight chance of a G3 strong geomagnetic storm. By days 3 and 4 (28-29 Mar) conditions expected to become generally Quiet (Kp1-2) in the absence of any further CME enhancements.

Energetic Particles / Solar Radiation: Solar radiation is continuing to decline from recent enhancement. A continued slow decline is expected in the absence of further significant flare activity, however continued CME influence lowers confidence in the near term, with a chance of further enhancement, this risk reducing somewhat into the period

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	50	30	10	1
Strong	G3	No	10	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	70
Very Active	R3 to R5 X	No	20	20	20	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	50	30	20	20
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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